REMARKS

The Office Action dated July 27, 2009, has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto.

Claims 1 and 7-14 are currently pending and under examination. By this Amendment, Claims 1 and 12 have been amended. Support for these amendments can be found in the specification and drawings in, for example, Figs. 1, 6-8, and 11 and their corresponding descriptions. No new matter has been introduced.

In the Office Action, Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,524,433 to Adamczyk et al. ("Adamczyk") in view of U.S. Patent No. 5,261,370 to Ogawa et al. ("Ogawa). Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adamczyk in view of Ogawa, and further in view of U.S. Patent No. 5,613,359 to Zahn et al. ("Zahn"). Further, Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adamczyk in view of Ogawa and further in view of U.S. Patent No. 5,606,855 to Tomisawa ("Tomisawa"). It is noted that Claim 1 has been amended. To the extent that the grounds for rejection are still applicable to the currently pending claims, they are respectfully traversed.

Claim 1, as amended, recites, among other things, that "a conduit connected to the bypass at .a location between the valve means and the adsorber and connected to the air intake system for recirculating the exhaust gas to the air intake system," "feedback loop means having an adaptive controller with an adaptive mechanism that estimates an adaptive parameter based on past values of a feedback correction coefficient and the

detected air/fuel ratio, the adaptive controller calculating the feedback correction coefficient based on the estimated adaptive parameter such that the detected air/fuel ratio converges to a desired air/fuel ratio," and "EGR correction coefficient calculating means for calculating an EGR correction coefficient when recirculating the exhaust gas to the air intake system."

The amendments made to Claim 1 has support in the specification as originally filed. For example, FIGS. 1 and 6-8 shows that the conduit 82 is located between the valve means 58, 60 and the adsorber 74. FIG. 11 of the present application illustrates that the adaptation mechanism estimates the adaptive parameter θ hat (k) based on the past values of the feedback correction coefficient (KSTR(k), KSTR(k-1), KSTR(k-2), KSTR(k-3)) and the detected air/fuel ratio KACT(k).

In the subject application, the conduit 82 is connected to the bypass 56 at a location between the valve means (exhaust pipe valve member 58 and bypass valve member 60) and adsorber 74. To facilitate the Examiner to understand the invention, Applicants provide a copy of Figs. 1 and 6-8 of the drawings with remarks for explanation. As shown, the unburnt component is likely to gather at the upstream side (rather than the downstream side). In the subject application, when the adsorbed component is to be purged to the air intake system, the exhaust gas can flow from the downstream side to the upstream side in a U-turn manner, since the conduit 82 is connected to the bypass 56 at a location between the valve means 58, 60 and adsorber 74, i.e., is connected to the bypass 56 at an upstream end.

The portion marked "A" in Fig. 6 shows that the conduit 82 is located between the valve means 58, 60, and the adsorber 74. Although not explicitly illustrated in these

figures, the location (between the valve means and adsorber) can be read, as a matter of course, from the operation of the system.

With this configuration, the component collected at the upstream side can be removed more than a case in which the exhaust gas flows from the upstream side to the downstream side, such as the case disclosed in Adamczyk.

Specifically, in Adamczyk, the conduit (designated by reference numeral 84) isconnected at a downstream end as illustrated in its Figs. 7 and 9 of Adamcyyk. In Adamczyk, since the conduit is connected at the downstream end, the purging exhaust gas does not U-turn and can only flow from the upstream side to the downstream side.

In addition, in Adamczyk, since the conduit is connected at the downstream end and the exhaust gas flow does not U-turn, it requires two valves to purge the adsorbed unburnt component to the air intake system, rending the configuration complicated.

In the Office Action, the Examiner alleges that "[a]s shown in Figure 7, Adamczyk, Jr. et al. disclose a system . . . . comprising:

> fuel injection quantity determining means (35) for determining a quantity of fuel injection to be supplied to the engine (line 56-59 of column 7);
>
> feedback loop means (35) having an adaptive controller with an adaptation mechanism that estimates an adaptive parameter (an amount of HC desorbed from the adsorber recirculating back to the engine), the adaptive controller calculates . . . . to a desired air-fuel ratio (stoichiometric air-fuel ratio) (see at least lines 56-59 of column 7); and
>
> fuel injection quantity correcting means (35) for correcting the quantity of fuel injection based on at least the EUR correction (lines 51-59 of column."

Based on the Examiner's quotation, lines 51-59 of column 7 of Adamczyk relate to embodiments shown in FIGS. 7 and 8 which monitor an active HC trap 31 with a single UEGO sensor 88 positioned downstream of the trap to measure the air/fuel ratio λ(t). In the embodiment of FIG. 7, the trap 31 is purged with hot exhaust gases that flow via a return pipe 84 into the intake manifold 37 of the engine. Under the control of EEC35 that determines the fuel delivery rate, the engine 32 produces a stoichiometric exhaust gas mixture at the inlet port to the trap 31.

What is meant in these passages is that EEC 35 adjusts the fuel delivery rate. To be more specific, lines 9-50 of the same column of Adamczyk mention similar embodiments in which "[t]he hydrocarbons in the purge stream through return pipe 84 are a source of fuel. As a result, the EEC 35 adjusts the fuel delivery rate downwardly under closed loop A/F control. The amount of hydrocarbons reintroduced to the engine via the pipe 84 can accordingly be quantified by monitoring the consequent change or shift in a calculated mean air/fuel which can be produced within the EEC during feedback A/F control of the engine with an EGO sensor located (39) upstream of the catalsty."

Thus, Adamczyk discloses accurately calculating the amount of the unburnt component (He) reintroduced to the engine based on the outputs of the air/fuel ratio detecting means (EGO sensor 39 or 84) and the air mass flow sensor 63, with the use of the equations (3)(4)(5), and correcting the quantity of fuel injection by the calculated amount of the unburnt component to converge the air/fuel ratio to the stoichiometric air/fuel ratio.

In other words, in addition of the lack of disclosure of "a conduit connected to the bypass at a location between the valve means and the adsorber and connected to the air intake system for recirculating the exhaust gas to the air intake system," Adamczyk further fails to teach or suggest that a feedback loop has the adaptive controller with the adaptation mechanism that estimates the adaptive parameter based on past values of the feedback correction coefficient and the detected air/fuel ratio and the adaptive controller calculates the feedback correction coefficient which can converges the air/fuel ratio to a desired air/fuel ratio (that is not limited to the stoichometric air/fuel ratio and includes a richer/leaner air/fuel ratio), as recited in amended Claim 1.

Further, with the configuration of the claimed invention, it becomes possible to eliminate the influence of the disturbance including the unburnt component (He) reintroduced to the engine from the air/fuel feedback control. In addition, the EGR correction coefficient is calculated and the quantity of fuel injection is corrected by the feedback correction coefficient and by the EGR correction coefficient.

That is, in the claimed invention, the EGR correction is made in a kind of feed-forward manner and the unburnt component included in the EGR is deemed as a kind of disturbance and is corrected in the feedback loop with the use of the adaptive controller.

Further in the Office Action, the Examiner admits that Adamczyk fails to disclose that the EGR correction coefficient calculating means and that the fuel injection quantity correcting means correct it based on the EGR correction coefficient. The Examiner, however, relies on Ogawa by alleging that Ogawa discloses calculating an ECR correction coefficient and correcting the fuel injection quantity based on this coefficient. However,

Applicants submit that neither Adamczyk nor Ogawa, alone or in combination, teaches or suggests a conduit connected to the bypass at a location between the valve means and the adsorber and connected to the air intake system for recirculating the exhaust gas to the air intake system," "feedback loop means having an adaptive controller with an adaptive mechanism that estimates an adaptive parameter based on past values of a feedback correction coefficient and the detected air/fuel ratio, the adaptive controller calculating the feedback correction coefficient based on the estimated adaptive parameter such that the detected air/fuel ratio converges to a desired air/fuel ratio," as recited in amended Claim 1.

According to MPEP, a *prima facie* case of obviousness must establish that the asserted combination of references teaches or suggests each and every element of the claimed invention. Since none of the cited art, alone or in combination, teaches or suggests each and every element of amended Claim 1, it would not have been obvious for one skilled in the art to combine the cited art to achieve the claimed invention. Claim 1, as amended, is therefore allowable over the cited art.

As to the rejection of Claims 7-14, Applicants submit that neither Zahn nor Tamisawa cures the deficiency of Adamczyk. Besides, Claims 7-14 depend from amended Claim 1 As stated above, since amended Claim 1 is allowable over the cited art, Claims 7-14 are likewise allowable at least due to their dependency from allowable independent claim and additional features recited therein.

CONCLUSION

For all of the above reasons, it is respectfully submitted that the currently pending claims are in condition for allowance and a Notice of Allowability is earnestly solicited.

If for any reason the Examiner feels the application is not now in condition for allowance it is respectfully requested that he contact, by telephone, the undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that any fees are due with respect to this paper, please charge Deposit Account No. 01-2300, referencing Atty. Docket No. 107101.00050.

Respectfully submitted,

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CMM/CYM

Enclosure: Marked-Version Figures 1 and 6-8

FIG. 1

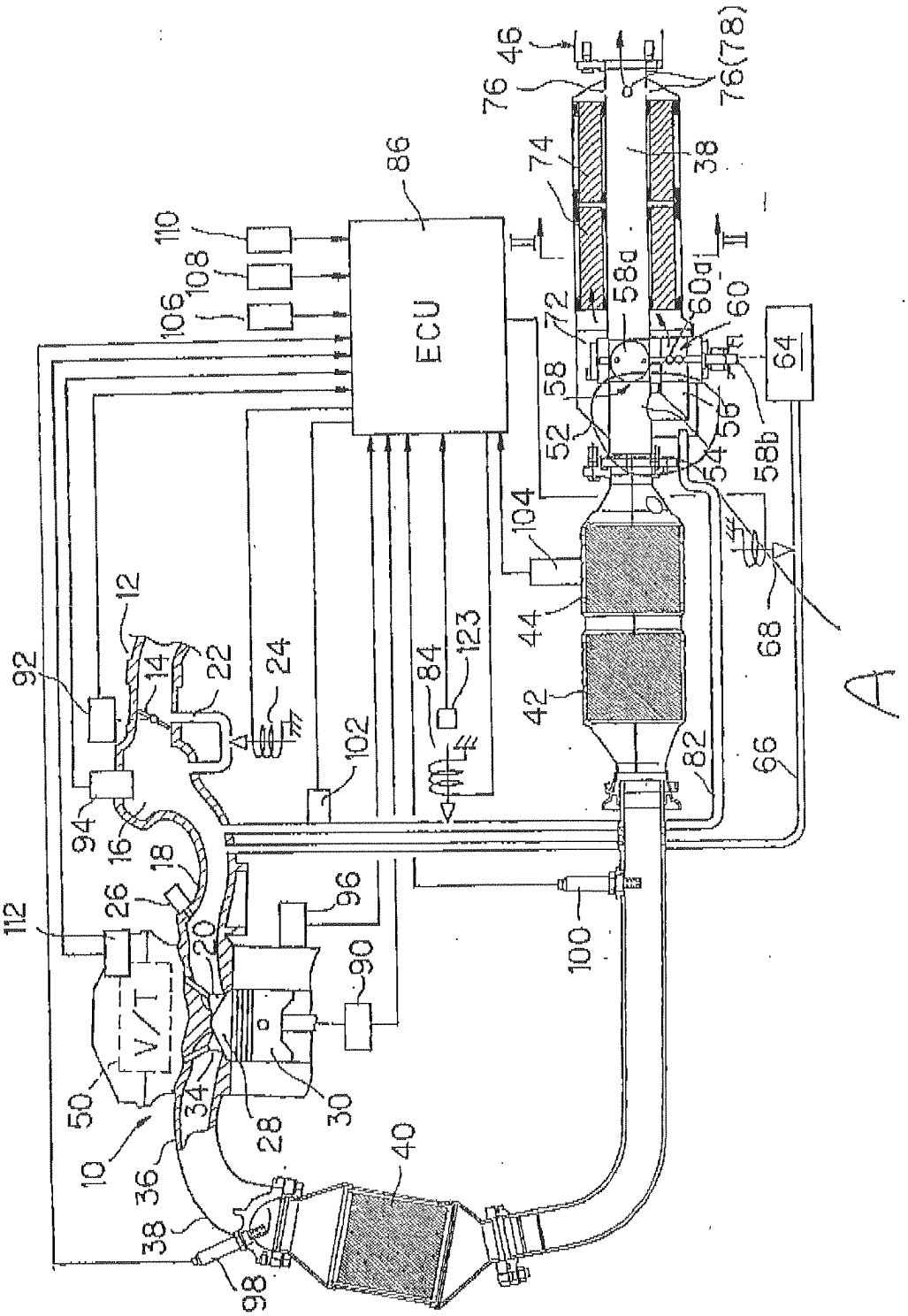


FIG.6

FROM ENGINE STARTING AND LOW TEMPERATURE (HC ADSORBTION MODE)

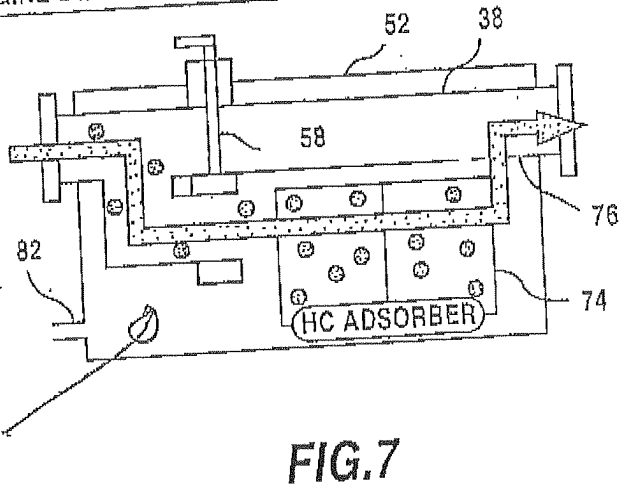
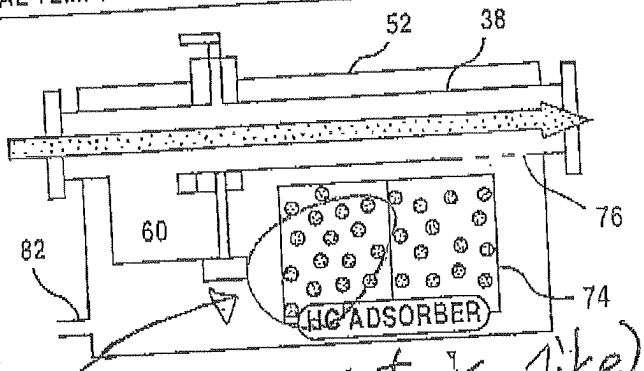


FIG.7

NORMAL TEMPERATURE AND WITHOUT EGR (HC TRAPPING MODE)



The unburnt component is likely to gather at the upstream side, but is able to be purged when the exhaust gas flows from the downstream side to the upstream side.

FIG.8

NORMAL TEMPERATURE AND WITH EGR (HC PURGING MODE)